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Christopher F. Regan
Allen, Dyer, Doppelt, Milbrath & Gilchrist, P.A.
P.O. Box 3791
Orlando, FL 32802-3791

EXAMINER	
PATHAK, SUDHANSHU C	
ART UNIT	**PAPER NUMBER**
2634	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/747,786	Applicant(s) BERNARDO ET AL.
	Examiner Sudhanshu C. Pathak	Art Unit 2634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *May 9th, 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *9-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *9-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *December 22nd, 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 9-to-32 are pending are pending in the application.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 9, 25 (apparatus, method), 12, 28 (apparatus, method) are rejected under 35 U.S.C. 103(a) as being unpatentable over Abarbanel at al. (5,923,760) in view of J. Lee et al. (Secure Communication Using Chaos, IEEE Global Telecommunications Conference, Globecom '95, November 1995, Pages 1183-1187).

Regarding to Claims 9, 25 (apparatus, method), 12, 28 (apparatus, method), Abarbanel discloses a chaotic communication system for use in a wired or wireless transmission links (Abstract, lines 1-17 & Column 1, lines 12-45 & Column 2, lines 41-67 & Column 3, lines 1-67) comprising a transmission channel (Fig. 1, element 26 & Fig. 4, element 51 & Fig. 5, element 80); a signal source for providing a discrete signal (Fig. 4, element 40 & Fig. 5, element 66); a chaotic modulator for modulating the discrete signal for transmitting over said transmission channel (Fig. 4, element 44 & Fig. 5, element 68); and a discriminator (receiver) for receiving the modulated discrete signal from said transmission channel (Fig. 4, element 56 & Fig. 5, element 84). Abarbanel further discloses the use of filters in chaotic systems,

which serve to suppress large spike components at specific frequencies (Column 1, lines 65-67 & Column 2, lines 1-5). However Abarbanel does not disclose the receiver to be an in coherent (self-synchoronizing) receiver.

Lee discloses a secure communications scheme using a chaotic communications system. Lee also discloses determining the data stream by comparing the power level of the dynamical error of each data stream (Page 1183, Abstract, lines 2-17 & Page 1187, Fig. 2-3). Lee further discloses that the advantage of the comparing the level to determine the received signal is that it does not require the synchronization of the receiver to the transmitter (Page 1183, Abstract, lines 8-17 & Page 1184, left-hand column, lines 1-11). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Lee teaches implementing a chaos modulator and an incoherent receiver to receive the transmitted signal and this can be implemented in the chaotic communication system as described in Abarbanel so as to provide a receiver so as to minimize the effect of the initial conditions and synchronization errors in the demodulation of the signal received at low SNR.

4. Claims 10, 26 (apparatus, method), 11, 27 (apparatus, method), 17, 18 & 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abarbanel at al. (5,923,760) in view of J. Lee et al. (Secure Communication Using Chaos, IEEE Global Telecommunications Conference, Globecom '95, November 1995, Pages 1183-1187) in further view of Cutler et al. (5,847,960).

Regarding to Claims 10, 26, Abarbanel in view of Lee discloses a chaotic communication system for use in a wired or wireless transmission links as described

above. Abarbanel further discloses implementing a filter at the receiver (Figure 1, element 28), which serve to suppress components of the noise at specified frequencies (Column 1, lines 65-67). Abarbanel also discloses that the frequency bandwidth of available transmission links lack a low frequency response with an inability to transmit dc-signals, and have a high frequency cutoff defining the upper end of the band (Column 2, lines 15-26). Abarbanel discloses a bandpass characteristic of the transmission channel and implementing a bandpass filter at the receiver (discriminator) so as to synchronize the receiver with the transmitted signal and allowing the demodulation of the received signal (Column 2, lines 40-55 & Column 4, lines 25-35 & Claim 6). However, Abarbanel does not disclose a rectifier connected to the high-pass filter and further a low-pass filter connected to the output of the rectifier.

Lee discloses a secure communications scheme using a chaotic communications system. Lee also discloses determining the data stream by comparing the power level of the dynamical error of each data stream (Page 1183, Abstract, lines 2-17 & Page 1187, Fig. 2-3). Lee further discloses maximally correlating the received signal to determine the cost function for determining the received signal (Page 1184, right-hand column, lines 1-55, Equation 4 & Page 1185, Equations 6-7 & 11). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that it is possible to implement the demodulation of maximally correlating the received signal as described in Lee in the system as described in Abarbanel perform the same function as a rectifier but digitally since the process of maximally

correlation is equivalent to rectification. Furthermore, there is no criticality in implementing a high pass filter at the front end of the receiver and as described in Abarbanel a bandpass filter performs the same function furthermore, a bandpass filter can be implemented using a high pass filter. However, Abarbanel in view of Lee does not disclose a low pass filter connected to the output of the rectifier.

Cutler discloses a fourth-order low pass filter to provide good smoothing while keeping the implementation simple (Column 9, lines 19-38, 65-67 & Column 10, lines 1-6). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that implementing the low pass filter as described in Cutler after the rectifier (correlator) as described in Abarbanel in view of Lee provides a smoothed and stable signal while keeping the overall filter implementation simple.

Regarding to Claims 11, 27, Abarbanel in view of Lee in further view of Cutler discloses a chaotic communication system for use in a wired or wireless transmission links comprising high pass and low pass filters and a correlator (rectifier) as described above. Lee further discloses comparing the power level of the dynamical errors of the data stream with a chosen threshold (Page 1184, right-hand column, lines 35-55, Equation 4 & Page 1187, Fig. 3). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Abarbanel in view of Lee in further view of Cutler satisfies the limitation of the claim.

Regarding to Claim 17, Abarbanel in view of Lee discloses a chaotic communication system for use in a wired or wireless transmission links (Abstract, lines 1-17 & Column 1, lines 12-45 & Column 2, lines 41-67 & Column 3, lines 1-67)

comprising a transmission channel (Fig. 1, element 26 & Fig. 4, element 51 & Fig. 5, element 80); a signal source for providing a discrete signal (Fig. 4, element 40 & Fig. 5, element 66); a chaotic modulator for modulating the discrete signal for transmitting over said transmission channel (Fig. 4, element 44 & Fig. 5, element 68); and an incoherent discriminator for receiving the modulated discrete signal from said transmission channel (Fig. 4, element 56 & Fig. 5, element 84). Abarbanel further discloses implementing a filter at the receiver (Figure 1, element 28), which serve to suppress components of the noise at specified frequencies (Column 1, lines 65-67). Abarbanel also discloses that the frequency bandwidth of available transmission links lack a low frequency response with an inability to transmit dc-signals, and have a high frequency cutoff defining the upper end of the band (Column 2, lines 15-26). Abarbanel discloses a bandpass characteristic of the transmission channel and implementing a bandpass filter at the receiver (discriminator) so as to synchronize the receiver with the transmitted signal and allowing the demodulation of the received signal (Column 2, lines 40-55 & Column 4, lines 25-35 & Claim 6). However, Abarbanel does not disclose a rectifier connected to the high-pass filter and further a low-pass filter connected to the output of the rectifier.

Lee discloses a secure communications scheme using a chaotic communications system. Lee also discloses determining the data stream by comparing the power level of the dynamical error of each data stream (Page 1183, Abstract, lines 2-17 & Page 1187, Fig. 2-3). Lee further discloses maximally correlating the received signal

to determine the cost function for determining the received signal (Page 1184, right-hand column, lines 1-55, Equation 4 & Page 1185, Equations 6-7 & 11). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that it is possible to implement the demodulation of maximally correlating the received signal as described in Lee in the system as described in Abarbanel perform the same function as a rectifier but digitally since the process of maximally correlation is equivalent to rectification. Furthermore, there is no criticality in implementing a high pass filter at the front end of the receiver and as described in Abarbanel a bandpass filter performs the same function, furthermore a bandpass filter can be implemented using a high pass filter. However, Abarbanel in view of Lee does not disclose a low pass filter connected to the output of the rectifier.

Cutler discloses a fourth-order low pass filter to provide good smoothing while keeping the implementation simple (Column 9, lines 19-38, 65-67 & Column 10, lines 1-6). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that implementing the low pass filter as described in Cutler after the rectifier (correlator) as described in Abarbanel in view of Lee provides a smoothed and stable signal while keeping the overall filter implementation simple.

Regarding to Claims 18, Abarbanel in view of Lee in further view of Cutler discloses a chaotic communication system for use in a wired or wireless transmission links comprising high pass and low pass filters and a correlator (rectifier) as described above. Lee further discloses comparing the power level of the dynamical errors of the data stream with a chosen threshold (Page 1184, right-

hand column, lines 35-55, Equation 4 & Page 1187, Fig. 3). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Abarbanel in view of Lee in further view of Cutler satisfies the limitation of the claim.

Regarding to Claims 19, Abarbanel in view of Lee in further view of Cutler discloses a chaotic communication system for use in a wired or wireless transmission links comprising high pass and low pass filters, and a correlator (rectifier) as described above. Abarbanel further discloses a chaotic communication system for use in a wired or wireless transmission links as described above. Abarbanel further discloses the receiver (discriminator) to be self-synchronizing (Column 1, lines 35-46 & Column 3, lines 37-51 & Column 4, lines 42-45). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Abarbanel in view of Lee in further view of Cutler satisfies the limitations of the claim.

5. Claims 13, 29 (apparatus, method), are rejected under 35 U.S.C. 103(a) as being unpatentable over Abarbanel at al. (5,923,760) in view of Lee (Secure Communication Using Chaos, IEEE Global Telecommunications Conference, Globecom '95, November 1995, Pages 1183-1187) in further view of Applicant Admitted Prior Art (AAPA).

Regarding to Claims 13, 29, Abarbanel in view of Lee discloses a chaotic communication system for use in a wired or wireless transmission links comprising an incoherent receiver as described above. However, Abarbanel does not specify the signal source to generate a low logic value signal having associated a chaotic

evolution corresponding to a complete Chua's attractor and further the low logic value corresponding to a left-hand lobe of the Chua's attractor.

The Applicant Admitted Prior Art (AAPA) discloses a chaotic communication system (Specification, Page 4, lines 30-35 & Page 5, lines 1-11) comprising a modulation method called chaos shift keying wherein one of two chaotic signals generated by two different systems or the same system are associated with a low logic value and a high logic value is transmitted (Specification, Page 5, lines 28-34). The AAPA further discloses a low logic value corresponding to a left-hand lobe of the Chua's attractor (Specification, Page 10, lines 15-30 & Figure 8-9). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that the modulation scheme as described in the AAPA can be implemented in the chaotic system as described in Abarbanel in view of Lee to provide distinct chaotic signals for the high and low logic values, thus satisfying the limitations of the claim.

6. Claims 14, 30 (apparatus, method), 16, 32 (apparatus, method), 21 & 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abarbanel at al. (5,923,760) in view of Lee (Secure Communication Using Chaos, IEEE Global Telecommunications Conference, Globecom '95, November 1995, Pages 1183-1187) in further view of Cutler et al. (5,847,960) in further view of Giacomini (6,016,078) in further view of Brenman et al. (4,590,942).

Regarding to Claims 14, 30 & 16, 32, Abarbanel in view of Lee discloses a chaotic communication system for use in a wired or wireless transmission links

comprising an incoherent receiver as described above. However, Abarbanel in view of Lee does not disclose the discriminator (receiver) to comprise a low pass filter.

Cutler discloses a fourth-order low pass filter to provide good smoothing while keeping the implementation simple (Column 9, lines 19-38, 65-67 & Column 10, lines 1-6). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that implementing the low pass filter as described in Cutler after the rectifier (correlator) as described in Abarbanel in view of Lee provides a smoothed and stable signal while keeping the overall filter implementation simple. However, Abarbanel in view of Lee in further view of Cutler does not disclose a null-threshold comparator connected to the output of the low pass filter for providing a square wave output.

Giacomini discloses a low offset output null-threshold comparator to output a square-wave signal for high precision output despite varying operating conditions such as temperature, supply voltage, bias current etc. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that the null-threshold comparator as described in Giacomini can be implemented in the receiver circuit as described in Abarbanel in view of Cutler so as to compare the multiple voltages to a threshold value so as to determine the validity of the received signal. However, Abarbanel in view of Lee in further view of Cutler in further view of Giacomini does not disclose a divider connected to the output of the comparator for scaling the square wave output signal.

Brenman discloses a divider circuit (Fig. 5, element 84 & Fig. 5a, element 86-88) to provide amplitude control for the output signal (Column 5, lines 40-50). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that the divider as described in Brenman can be implemented at the output of the comparator as described in Abarbanel in view of Lee in further view of Cutler in further view of Giacomini so as to control the output amplitude of the comparator to a desired value, thus Abarbanel in view of Cutler in further view of Giacomini in further view of Brenman satisfies the limitation of the claim.

Regarding to Claims 21 & 24, Abarbanel discloses a chaotic communication system for use in a wired or wireless transmission links (Abstract, lines 1-17 & Column 1, lines 12-45 & Column 2, lines 41-67 & Column 3, lines 1-67) comprising a transmission channel (Fig. 1, element 26 & Fig. 4, element 51 & Fig. 5, element 80); a signal source for providing a discrete signal (Fig. 4, element 40 & Fig. 5, element 66); a chaotic modulator for modulating the discrete signal for transmitting over said transmission channel (Fig. 4, element 44 & Fig. 5, element 68); and a discriminator for receiving the modulated discrete signal from said transmission channel (Fig. 4, element 56 & Fig. 5, element 84). However, Abarbanel does not disclose the discriminator (receiver) to be an incoherent receiver.

Lee discloses a secure communications scheme using a chaotic communications system. Lee also discloses determining the data stream by comparing the power level of the dynamical error of each data stream (Page 1183, Abstract, lines 2-17 & Page 1187, Fig. 2-3). Lee further discloses that the advantage of the comparing the

level to determine the received signal is that it does not require the synchronization of the receiver to the transmitter (Page 1183, Abstract, lines 8-17 & Page 1184, left-hand column, lines 1-11). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Lee teaches implementing a chaos modulator and an incoherent receiver to receive the transmitted signal and this can be implemented in the chaotic communication system as described in Abarbanel so as to provide a receiver so as to minimize the effect of the initial conditions and synchronization errors in the demodulation of the signal received at low SNR. Abarbanel in view of Lee does not disclose the discriminator (receiver) to comprise a low pass filter.

Cutler discloses a fourth-order low pass filter to provide good smoothing while keeping the implementation simple (Column 9, lines 19-38, 65-67 & Column 10, lines 1-6). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that implementing the low pass filter as described in Cutler after the rectifier (correlator) as described in Abarbanel in view of Lee provides a smoothed and stable signal while keeping the overall filter implementation simple. However, Abarbanel in view of Lee in further view of Cutler does not disclose a null-threshold comparator connected to the output of the low pass filter for providing a square wave output.

Giacomini discloses a low offset output null-threshold comparator to output a square-wave signal for high precision output despite varying operating conditions such as temperature, supply voltage, bias current etc. Therefore, it would have

been obvious to one of ordinary skill in the art at the time of the invention that the null-threshold comparator as described in Giacomini can be implemented in the receiver circuit as described in Abarbanel in view of Lee in further view of Cutler so as to compare the multiple voltages to a threshold value so as to determine the validity of the received signal. However, Abarbanel in view of Lee in further view of Cutler in further view of Giacomini does not disclose a divider connected to the output of the comparator for scaling the square wave output signal.

Brenman discloses a divider circuit (Fig. 5, element 84 & Fig. 5a, element 86-88) to provide amplitude control for the output signal (Column 5, lines 40-50). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that the divider as described in Brenman can be implemented at the output of the comparator as described in Abarbanel in view of Lee in further view of Cutler in further view of Giacomini so as to control the output amplitude of the comparator to a desired value, thus Abarbanel in view of Lee in further view of Cutler in further view of Giacomini in further view of Brenman satisfies the limitation of the claim.

7. Claims 15, 31 (apparatus, method), 22 & 23, are rejected under 35 U.S.C. 103(a) as being unpatentable over Abarbanel at al. (5,923,760) in view of Lee (Secure Communication Using Chaos, IEEE Global Telecommunications Conference, Globecom '95, November 1995, Pages 1183-1187) in further view of Cutler et al. (5,847,960) in further view of Giacomini (6,016,078) in further view of Brenman et al. (4,590,942) in further view of Applicant Admitted Prior Art (AAPA).

Regarding to Claims 15, 31, 22 & 23, Abarbanel in view of Lee in further view of Cutler in further view of Giacomini in further view of Brenman discloses a chaotic communication system for use in a wired or wireless transmission links comprising an incoherent receiver further comprising a low pass filter, null-threshold comparator, and a divider as described above. However, these references do not disclose a signal source to generate a low logic value signal that is associated with a chaotic dynamics corresponding to a left-hand lobe of a Chua's attractor.

The Applicant Admitted Prior Art (AAPA) discloses a chaotic communication system (Specification, Page 4, lines 30-35 & Page 5, lines 1-11) comprising a modulation method called chaos shift keying wherein one of two chaotic signals generated by two different systems or the same system are associated with a low logic value and a high logic value is transmitted (Specification, Page 5, lines 28-34). The AAPA further discloses a low logic value corresponding to a left-hand lobe of the Chua's attractor (Specification, Page 10, lines 15-30 & Figure 8-9). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that the modulation scheme as described in the AAPA can be implemented in the chaotic system as described in Abarbanel in view of Cutler in further view of Giacomini in further view of Brenman to provide distinct chaotic signals for the high and low logic values, thus satisfying the limitations of the claim.

8. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Abarbanel at al. (5,923,760) in view of J. Lee et al. (Secure Communication Using Chaos, IEEE Global Telecommunications Conference, Globecom '95,

November 1995, Pages 1183-1187) in further view of Cutler et al. (5,847,960) in further view of Applicant Admitted Prior Art (AAPA).

Regarding to Claim 20, Abarbanel in view of Lee in further view of Cutler discloses a chaotic communication system for use in a wired or wireless transmission links comprising an incoherent receiver further comprising high pass and low pass filters, and a correlator (rectifier) as described above. However, the above references do not specify the signal source to generate a low logic value signal having associated a chaotic evolution corresponding to a complete Chua's attractor and further the low logic value corresponding to a left-hand lobe of the Chua's attractor.

The Applicant Admitted Prior Art (AAPA) discloses a chaotic communication system (Specification, Page 4, lines 30-35 & Page 5, lines 1-11) comprising a modulation method called chaos shift keying wherein one of two chaotic signals generated by two different systems or the same system are associated with a low logic value and a high logic value is transmitted (Specification, Page 5, lines 28-34). The AAPA further discloses a low logic value corresponding to a left-hand lobe of the Chua's attractor (Specification, Page 10, lines 15-30 & Figure 8-9). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that the modulation scheme as described in the AAPA can be implemented in the chaotic system as described in Abarbanel in view of Lee in further view of Cutler to provide distinct chaotic signals for the high and low logic values, thus satisfying the limitations of the claim.

Response to Arguments

9. Applicant's arguments filed on May 9th, 2005 have been fully considered but they are not persuasive. In regards to the arguments presented the Abarbanel at al. (5,923,760) reference discloses all the limitations as recited in the claims 9, 12, 25 & 28 i.e. a communication system comprising a transmission channel a signal source for providing a discrete signal and a chaotic modulator. Furthermore, the limitations of a transmission channel and a signal source are also inherent to any communication system since a source is required to provide the information needed to be communicated and further a communication channel is inherent since the information needs to be transmitted over a channel so as to communicate the information. The Abarbanel reference further discloses the communication system to include a chaotic modulator. Abarbanel further discloses the use of filters in chaotic systems, which serve to suppress large spike components at the specified frequencies (Column 1, lines 65-67 & Column 2, lines 1-5). However, Abarbanel does not disclose the receiver in the communication system to be an in coherent (self-synchoronizing) receiver.

This limitation is taught in the Lee et al. (Secure Communication Using Chaos, IEEE Global Telecommunications Conference, Globecom '95, November 1995, Pages 1183-1187) which discloses a secure communications scheme using a chaotic communications system (Abstract, line 1). Lee further discloses the receiver to be an incoherent (self-synchronizing) receiver (Abstract, lines 6-16 & Page 1184, left-column, lines 1-10). Lee also discloses determining the

data stream by comparing the power level of the dynamical error of each data stream (Page 1183, Abstract, lines 2-17 & Page 1187, Fig. 2-3). Lee further discloses that the advantage of the comparing the level to determine the received signal is that it <u>does not require the synchronization of the receiver to the transmitter or knowledge of the transmitter</u> (Page 1183, Abstract, lines 8-17 & Page 1184, left-hand column, lines 1-11). Lee further discloses a chaotic modulator to transmit chaotic signals modulating the data bits (Page 1183, right-column, lines 32-39). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Lee teaches implementing a chaos modulator and an incoherent receiver to receive the transmitted signal and this can be implemented in the chaotic communication system as described in Abarbanel so as to minimize the effect of the initial conditions and synchronization errors in the demodulation of the signal received at low SNR and high noise channel conditions, thus providing a robust chaotic receiver. Therefore, Abarbanel in view of Lee indeed satisfies the limitations of the claims.

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and

any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure, it is recommended to the applicant to amend all the claims so as to be patentable over the cited prior art of record. A detailed list of pertinent references is included with this Office Action (See Attached "Notice of References Cited" (PTO-892)).

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sudhanshu C. Pathak whose telephone number is (571)-272-3038. The examiner can normally be reached on M-F: 9am-6pm.

    - If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on (571)-272-3056
    - The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

- Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Sudhanshu C. Pathak

STEPHEN CHIN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600